

WHAT IS CLAIMED IS:

1. A speed change mechanism of an automatic transmission, comprising:
 - a first planetary gear unit which includes a sun gear, a rotation input member and a rotation output member, the first planetary gear unit outputting a reduced speed rotation from the rotation output member upon receiving a rotation from a prime mover by the rotation input member;
 - a speed change unit to which the reduced speed rotation is applied from the rotation output member of the first planetary gear unit, the speed change unit being arranged at an opposite position of the prime mover with respect to the first planetary gear unit;
 - an oil pump arranged between the first planetary gear unit and the prime mover and driven by the prime mover, the oil pump including a case to which the sun gear of the first planetary gear unit is connected;
 - friction elements which selectively engage and disengage the rotation input and output members of the first planetary gear unit and rotation members of the speed change unit for achieving a desired speed position; and
 - a direct clutch arranged to directly transmit the rotation from the prime mover to the speed change unit, the direct clutch including an annular clutch pack which is concentrically disposed around the first planetary gear unit and a clutch piston which is arranged at an opposite position of the oil pump with respect to the first planetary gear unit for actuating the annular clutch pack.
2. A speed change mechanism as claimed in Claim 1, in which the clutch piston is arranged between the first planetary gear unit and the speed change unit.
3. A speed change mechanism as claimed in Claim 1, further

comprising:

an input shaft rotatably supported by the case of the oil pump, the input shaft being connected to the rotation input member of the first planetary gear unit;

5 an intermediate shaft coaxially aligned with the input shaft permitting a relative rotation therebetween, the intermediate shaft being arranged to concentrically mount thereabout the speed change unit; and

10 a clutch drum radially outwardly extending from the intermediate shaft.

4. A speed change mechanism as claimed in Claim 3, in which the clutch drum includes a cylindrical recess in which the clutch piston of the direct clutch is slidably received to define therebetween a work chamber for the direct clutch.

15 5. A speed change mechanism as claimed in Claim 4, in which the direct clutch further comprises a clutch operation oil line through which a hydraulic pressure is fed to the work chamber,

20 the clutch operation oil line including an oil passage formed in the case of the oil pump, an oil passage formed in the input shaft and an oil passage formed in the intermediate shaft.

25 6. A speed change mechanism as claimed in Claim 3, further comprising:

an hollow shaft in which the intermediate shaft is rotatably received; and

30 a drum-shaped connecting member arranged to surround the clutch drum, one end of the connecting member being connected to the rotation output member of the first planetary gear unit and the other end of the connecting member being connected to the hollow shaft.

7. A speed change mechanism as claimed in Claim 1, in which the rotation input member of the first planetary gear unit is a ring gear and the rotation output member of the first planetary gear unit is a pinion carrier.

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8. A speed change mechanism as claimed in Claim 1, in which the rotation input member of the first planetary gear unit is a pinion carrier and the rotation output member of the first planetary gear unit is a ring gear.

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9. A speed change mechanism as claimed in Claim 7, in which the first planetary gear unit is of a single pinion type, which includes the sun gear, the ring gear, pinions each being meshed with both the sun gear and the ring gear and the pinion carrier.

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10. A speed change mechanism as claimed in Claim 8, in which the first planetary gear unit is of a double pinion type, which comprises the sun gear, the ring gear, first and second groups of pinions each being meshed with both the sun gear and the ring gear and the pinion carrier.

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11. A speed change mechanism as claimed in Claim 1, in which the speed change unit comprises:

25 a second planetary gear unit of a single pinion type which includes a sun gear, a ring gear, pinions each being meshed with both the sun gear and the ring gear and a pinion carrier carrying the pinions; and

30 a third planetary gear unit of a double sun gear type which includes two sun gears, a ring gear, pinions each being meshed with the two sun gears and the ring gear and a pinion carrier carrying the pinions.

12. A speed change mechanism as claimed in Claim 1, in which

the case of the oil pump is formed with a cylindrical center boss about which the sun gear of the first planetary gear unit is non-rotatably disposed through a serration connection therebetween.

5 13. A speed change mechanism as claimed in Claim 1, in which the case of the oil pump is formed with a cylindrical center boss which is integrally formed with the sun gear of the first planetary gear unit.